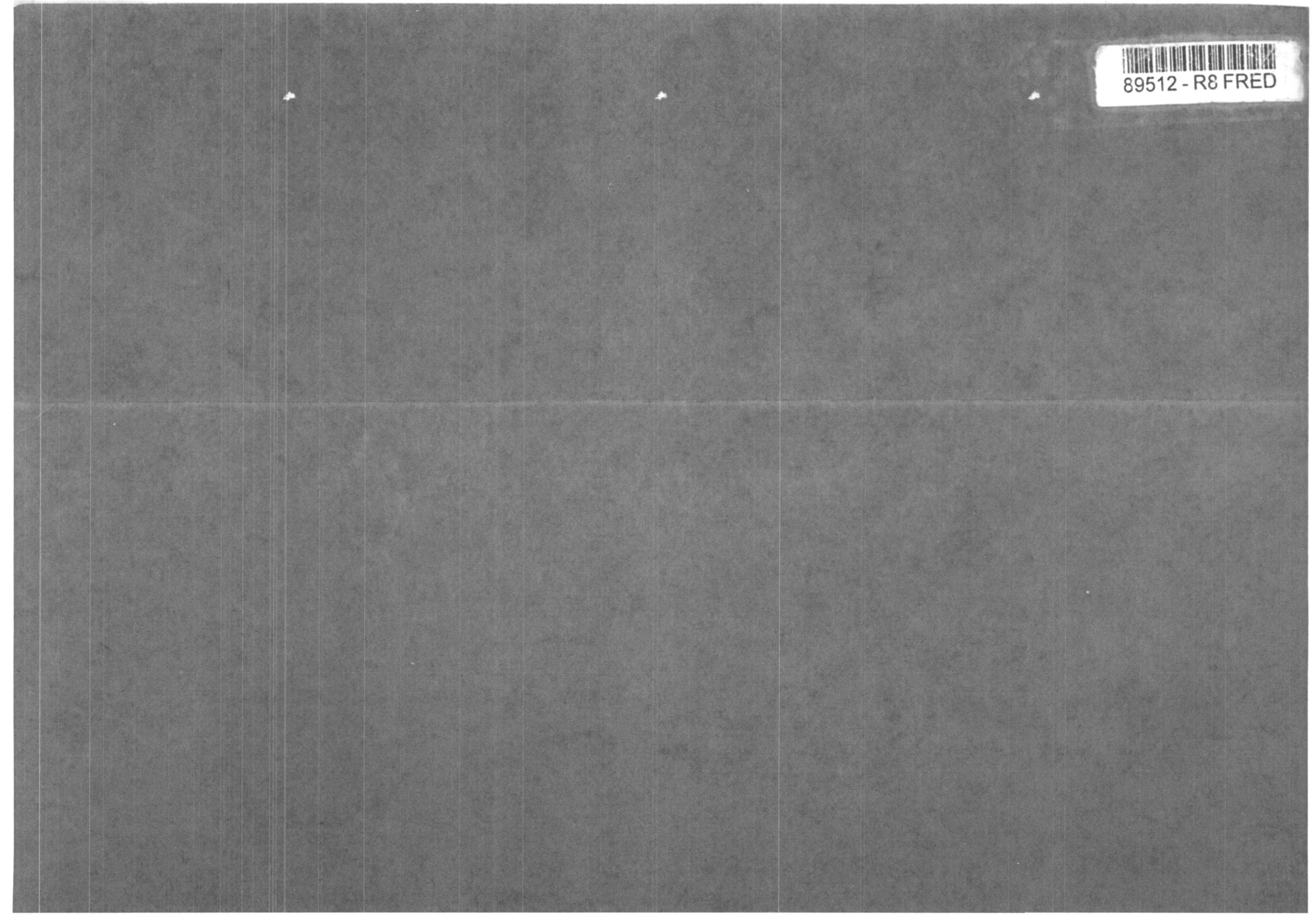


Figure 1 DWD-1 Well Schematic Diagram

CURRENT WELL SCHEMATIC

Well Name Doe Canyon 1 (DWD-1) **Original Well Name** DCU 19-40-17 #1
Pilot API # 05-033-06078
S/T API # : N/A
Section 19 **Township** 40N **Range** 17W
Surface Hole: 240' FNL, 240' FEL Section 19, T40N R17W NMPM Elevation 7264'

Spud Date: 11/1/1983
Pilot Completion Date: 5/16/1984
Re-entry Start Date: 8/13/2012
Re-entry Completion Date: 2/14/2013

Updated: 6/13/2013 WDS

Conductor Casing TOC behind 4 1/2"@340' per CBL 1/21/2013
Size 30 in
Set at 59 ft Conductor @ **59** ft

Surface Casing 7-5/8" Csg Patch @ **806** ft
Size 10-3/4 in
Set at 3807 ft TOC 7-5/8" @2,830 per CBL 8/17,2013
Wt. 45.5 ppf Grade K-55 surface to 3807 ft
Hole Size 14-3/4 in
Est. T.O.C. surface ft
10-3/4" Csg Shoe @ **3807** ft

Production Casing
Size 7-5/8 in
Wt. 26.4 ppf Grade K-55 from surface to 4168 ft
Wt. 26.4 ppf Grade L-80 from 4168 to 5487 ft
Wt. 29.7 ppf Grade L-80 from 5487 to 5968 ft
Wt. 39 ppf Grade SS-95 from 5968 to 8051 ft
Wt. 33 ppf Grade 13 CR from 8051 to 8479 ft
Hole Size 9-1/2 in
Est. T.O.C. 2800 ft

Production Liner
Size 4-1/2 in
Wt. 11.6 ppf Grade J-55 from surface to 8243 ft

ProductionTubing

Run Date: 2/12/13	Top	Bottom
KB	0	9
250 JTS 2-3/8" 4.6# EUE 8RD CLS TBG	9	8171
ON/OFF TOOL	8171	8172
NP ASIX Packer	8172	8178
1 PUP 2-2/8" 4.6# EUE 8RD CLS TBG	8178	8189

Leadville Top @ 8091'
Set Date: 2/8/13
Pkr Set @ **8172** ft

Acid Date: 1/18/84, 4/4/84
Acidize perfs w/ 20,000gal 15% HCl

4-1/2" Csg Shoe @ **8243** ft

Acid Date: 4/18/84
Acid stimulate perfs w/ 40,000gal 15% HCl and 40,000gal salt sat gel in 4 stages

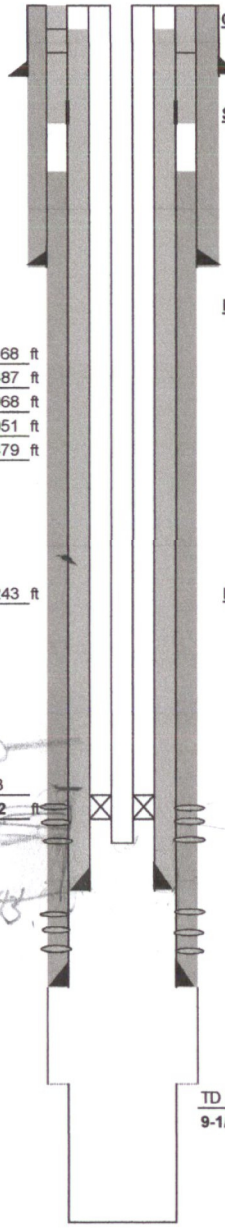
TD Date: 1/10/84
PBTD @ **8326** ft

7-5/8" Csg Shoe @ **8479** ft

Acid Date: 9/29/12
Acidize sqzd perfs w/ 5,000 gal 15% HCl

Acid Dates: 10/2/12, 10/3/12
Acidize sqzs & open perfs w/ 2,000 gal 18% HCl & 9,000 gal 28% HCl

TD Date: 9/13/12
6-1/2" OH to 9500'



Conductor Cement
cement with ready-mix to suface

Surface Cement
Date Cemented: 11/13/1983
Lead : 2680 sx Lite, 2% CaCl2, 1/4#/sk flocele
Tail : 300 sx Class B, 32% CaCl2, 1/4#/sk flocele, 1% Halad-9
Note : circ 40 bbls dehydrated cmt

Prod Cement
Date Cemented: 12/6/1983
Lead: 1215 sx Lite, 1/4#/sk flocele, 12.8% Salt
Tail: 150 sx Class H, 0.6% HR4
disp w/ 388 bbl H2O w/ Tretolite K700 & K490
Note : no cmt to pits, ran temp survey TOC = 550'
CBL run 8/17/12 TOC = 2800'

Date Patch Cemented: 9/22/2012
Lead: 435 sx 50/50/POZ, 2% CaCl2, .1% CFR-3
Note : circ to surface, rev circ 17.7 bbls

Liner Cement
Date Cemented: 1/12/2013
Lead: 670 sx Lite, .2% HR-5
Tail: 150 sx 50/50/POZ, .1% CFR-3, .2% Halad-9
Note : No cmt to surface

Sqz Date: 3/13/84
Cmt sqz perf from 8100' to 8286' w/ 200 sx

Perf Dates: 3/14/84, 3/19/84, 4/16/84
7924 - 7925, 8065 - 8064
8100' - 8134', 8143' - 8146', 8158' - 8162'
8176' - 8188', 8212' - 8218', 8278' - 8286'
4 shots/ft with 292 total shots (3 times)

Sqz Dates: 8/28/12 & 8/30/13
Cmt sqz perfs w/ 200 sx + 300 sx Class G

Perf Date: 9/30/12 & 10/3/12
8398' - 8474' & 8278' - 8333'
Re perf above interval 2/5/13

TD Date: 12/3/83
9-1/2" OH to 8482'

Era	System	Stratigraphic Unit	Unit Thickness (feet)	Physical Characteristics	Hydrogeologic Unit	Hydrologic Characteristics		
Cenozoic	Quaternary	Alluvium	0–100	Alluvial sands and gravels, loess, colluvium, windblown sands	Alluvium	Yields large quanities for domestic, stock, and municipal	} Section Not Present in Local Study Area	
Mesozoic	Upper Cretaceous	Mancos Shale	1,000–5,000	Shales interbedded with minor sandstone	Cretaceous confining beds	Confining unit; none		
	Lower Cretaceous	Dakota Sandstone	0–200	Fine-to coarse-grained cross-bedded sandstone	Mesozoic sandstone aquifer	Yields some water, stock and domestic		Upper Groundwater System
		Burro Canyon Fm	0–250	Conglomerate, sandstone and shale		Yields water to springs		
	Upper Jurassic	Morrison Formation: Brushy Basin Member	400–500	Shales interbedded with minor sandstone		None		
		Morrison Formation: Saltwash Member	300	Medium-grained sandstone interbedded with red shale		Yields small quantities, stock and domestic		
	Upper and Middle Jurassic	Summerville Fm	0–120	Shales interbedded with minor sandstone		None		
		Entrada Sandstone	15–170	Buff to grayish-white cross-bedded sandstones		Yields water		
		Carmel Formation	0–40	Siltstone and mudstone interbedded with fine-grained sandstone		None		
		Navajo Sandstone	0–125	Fine-grained, cross-bedded quartz sandstone		Small to moderate amounts from fractures, stock and domestic		
		Kayenta Formation	0–200	Sandstone interbedded with siltstone and thin-bedded shale		Yields little to no water		
	Upper Triassic	Wingate Sandstone	0–400	Medium grained, poorly cemented, cross-bedded sandstone		Yields water to numerous springs	Approximate Base of Usable USDW's	
		Dolores Formation	150–230	Pink to red mudstone and fine-grained sandstone. Not present in all areas	Mesozoic-Upper Paleozoic confining beds	Not water bearing		
		Chinle Formation	0–500	Shale, siltstones, interbedded with minor fine-grained sandstone		Yields small quantities where fractured, stock and domestic		
	Lower Triassic	Moenkopi Formation	0–480	Mudstone interbedded with minor sandstone		Yields small quantities, stock and domestic		
Paleozoic	Permian	Cutler Formation	0–3,500	Fine grained sandstone interbedded with minor conglomerate and mudstone		Yields small quantities where fractured, stock and domestic	Approximate Base Lowermost Possible USDW	
	Pennsylvanian	Hermosa Formation	0–3,900	Shales, limestones, salt and gypsum; includes the Paradox Member	Confining salt beds	None	Proposed Confining Zone	
	Mississippian	Leadville Limestone	20–100	Massive to thinly laminated, gray buff and yellow limestone	Lower Paleozoic carbonate aquifer	Transmits saltwater through fractures	Proposed Injection Zone	Lower Groundwater System
	Devonian and Cambrian	Ouray, Elbert, and Ignacio Formations	0–150	Limestone, shale, dolomite; Ignacio is a quartzite				

Source: Topper, R., Spray, K. L., Bellis, W. H., Hamilton, J. L., and Barkmann, P. E., 2003, Ground Water Atlas of Colorado, Colorado Geological Survey, Special Publication No. 53, 210 pp.

KINDER MORGAN
CO_2 COMPANY, L.P.

Figure D.4

Paradox Basin
Stratigraphic Column

EnviroGroup Limited, Centennial, Colorado	AGW	MGE
	KM-0645	APR 2010

PART I. AUTHORIZATION TO INJECT

Pursuant to the Underground Injection Control (UIC) Regulations of the U.S. Environmental Protection Agency codified at Title 40 of the Code of Federal Regulations, Parts 124, 144, 146, and 147

Kinder Morgan CO_2 Company, LP
17801 Hwy 491
Cortez, CO 81321

hereby referred to as the "Permittee", is authorized to operate a Class I injection well, **DWD-1** located in the NE ¼ NE ¼ at 240 feet (ft) from the north line and 240 ft from the east line of Section 19, Township 40 North, Range 17 West, Dolores County, Colorado. Injection shall be for the purpose of industrial waste fluid disposal into the gross intervals of the Leadville – Ouray Formation, 8,090 ft – 8,371 ft; Undifferentiated Devonian, 8,371 ft – 8,681 ft; and Undifferentiated Cambrian, 8,681 ft to 9,180 ft, in accordance with conditions set forth herein.

The Environmental Protection Agency (EPA) Underground Injection Control (UIC) program regulates the injection of fluids into injection wells so that injection does not endanger underground sources of drinking water (USDWs). EPA UIC Permit conditions are based on authorities set forth at 40 CFR Parts 144 and 146, and address potential impacts to USDWs.

Under 40 CFR Part 144, Subpart D, certain conditions apply to all UIC Permits and may be incorporated either expressly or by reference. General permit conditions for which the content is mandatory and not subject to site specific differences are not discussed in this document. Issuance of this Permit does not convey any property rights of any sort or any exclusive privilege, nor does it authorize injury to persons or property or invasion of other private rights, or any infringement of other Federal, State, or local laws or regulations (40 CFR 144.35).

All conditions set forth herein refer to Title 40 Parts 124, 144, 146, and 147 of the Code of Federal Regulations and are regulations that are in effect on the date that this permit becomes effective.

This permit is issued for **ten (10) years**, unless terminated. It is the Permittee's responsibility to read and understand all provisions of this permit. The permit will **expire at midnight ten (10) years after the effective date of this permit**, or upon delegation of primary enforcement responsibility for the UIC 1422 Program to the State of Colorado, unless that State has adequate authority and chooses to adopt and enforce this permit as a State permit.

Issue Date: JUN 22 2012

Effective Date: JUN 22 2012

Callie A. Videtich
Acting Assistant Regional Administrator
Office of Partnerships and Regulatory Assistance

KINDER MORGAN

PROPOSED WELL SCHEMATIC

Well Name: Doe Canyon 1 (DWD-1) | Original Well Name: DCU 19-40-17 #1 | Spud Date: 11/1/1983
Pilot API #: 05-033-06078 | Pilot Completion Date: 5/16/1984
S/T API #: N/A | Re-entry Start Date:
Section: 19 | Township: 40N | Range: 17W | Re-entry Completion Date:
Surface Hole: 240' FNL, 240' FEL
Elevation (GR): 7264'
KB: 27.5'

NOT TO SCALE

Conductor Casing
Size 30 in
Set at 59 ft
Conductor @ 59 ft

Surface Casing
Size 10-3/4 in
Set at 3807 ft
Wt. 45.5 ppf Grade K-55 surface to 3807 ft
Hole Size 14-3/4 in
Est. T.O.C. surface ft
Csg Shoe @ 3807 ft

Production Casing
Size 7-5/8 in
Wt. 26.4 ppf Grade K-55 surface to 4166 ft
Wt. 26.4 ppf Grade L-80 4166 to 5487 ft
Wt. 29.7 ppf Grade L-80 5487 to 5968 ft
Wt. 39 ppf Grade SS-95 5968 to 8051 ft
Wt. 33 ppf Grade 13 CR 8051 to 8479 ft
Hole Size 9-1/2 in

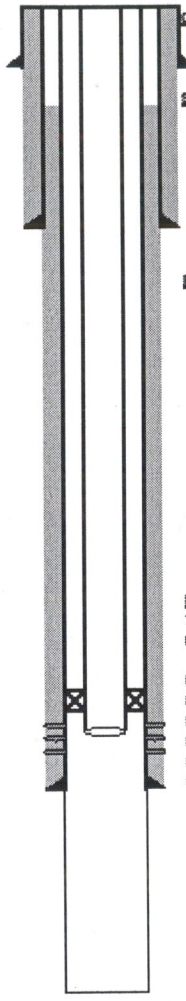
Liner
Size 5-1/2 in
Wt. 17 ppf Grade 13 CR 7725 to 9180 ft

Injection Tubing
4 1/2" Plastic Coated Tubing
5 1/2" x 4 1/2" packer
10' 4 1/2" 13Cr

Formation Tops

Chinle	1532 ft
Cutler	2426 ft
Upper Hermosa	4311 ft
Desert Creek	6027 ft
Paradox	6076 ft
Lower Hermosa	7720 ft
Molas	7973 ft
Leadville	8090 ft
Ouray	8322 ft
Elbert	8371 ft
Cambrian	8681 ft

Packer @ 7875 ft
Csg Shoe @ 8479 ft
Proposed TD @ 9180 ft



Conductor Cement
cement with ready-mix to surface

Surface Cement
Date Cemented: 11/13/1983
Lead: 2680 sx Lite, 2% CaCl2, 1/4#/sk flocele
Tail: 300 sx Class B, 32% CaCl2, 1/4#/sk flocele, 1% Halad-9
Note: circ 40 bbls dehydrated cmt

Prod Cement
Date Cemented: 12/6/1983
Lead: 1215 sx Lite, 1/4#/sk flocele, 12.8% Salt
Tail: 150 sx Class H, 0.6% HR4
disp w/ 388 bbl H2O w/ Tretolite K700 & K490
Note: No cmt to pits, ran temp survey. TOC @ 550'.

SQZ'd Perforations (Cement squeeze prior to deepening)
7924-7925
8064-8065

8100-8134 136 shots
8143-8148 20 shots
8158-8162 32 shots
8176-8188 48 shots
8212-8218 24 shots
8278-8286 32 shots

APPENDIX E OPERATING REQUIREMENTS

MAXIMUM ALLOWABLE INJECTION PRESSURE:
Maximum Allowable Injection Pressure (MAIP) as measured at the surface shall not exceed the pressure(s) listed below:

Well Name: DWD-1
Maximum Allowed Injection Pressure: 1,000 psi

INJECTION ZONE(S):
Injection is permitted only within the approved injection interval listed below. Injection perforations may be altered provided they remain within the approved injection interval and the Permittee provides notice to the Director in accordance with Part II, Section A.6. Specific injection perforations can be found in APPENDIX A.

Doe Canyon (DWD-1)

FORMATION NAME	APPROVED INJECTION INTERVAL, ft
Leadville-Ouray	8,090 – 8,371
Devonian (Elbert)	8,371 – 8,681
Cambrian	8,681 – 9,180

FORMATION NAME	OPEN PERFORATIONS OR HOLE, ft
Leadville-Ouray	8,100 – 8,286
Devonian (Elbert) - Cambrian	8,479 -9,180

ANNULUS PRESSURE:
The annulus pressure shall be maintained at/or below twenty-five (25) psi gauge as measured at the wellhead. If this pressure cannot be maintained at/or below 25 psi, the Permittee shall follow the procedures listed under Part II, Section D.6 of this permit.

MAXIMUM INJECTION VOLUME:
There is no limitation on the number of barrels per day (bbls/day) of water that shall be injected into this well, provided further that in no case shall injection pressure exceed the limit shown above.

TABLE 1.1
WELL STATUS / DATE OF OPERATION
CONVERSION WELLS

Well Name	Well Status	Date of
DWD-1	New	5/16/1984

PART II. Permit Considerations (40 CFR 146.24)

Geologic Setting (TABLE 2.1)

TABLE 2.1
GEOLOGIC SETTING
DWD-1

FORMATION NAME	GEOLOGICAL DESCRIPTION	TOP DEPTH, ft	BOTTOM DEPTH, ft	TDS mg/l	ZONE TYPE
Quaternary	Alluvial sands and gravels, loess, colluvium windblown sands	0	995	< 10,000	USDW
Carmel	Siltstone, shale, limestone	995	1050	< 10,000	Confinement
Navajo	Sandstone	1050	1437	< 10,000	USDW
Wingate	Sandstone	1437	1532	< 10,000	USDW
Chinle	Siltstone, sandstone, shale, and limestone	1532	2323	< 10,000	USDW
Chinarump		2323	2426	< 10,000	USDW
Cutler	Sandstones and conglomerates	2426	4311	6,420	USDW & Confinement
U Hermosa	Carbonate rocks with minor fine-grained elastics	4311	6027	6,730 mg/l – 381,436 mg/l	Confinement
Desert Creek	Carbonate rocks	6027	6076	>10,000	Confinement
Top Salt	Impermeable salt	6076	7996	>10,000	Confinement
Base Salt	Impermeable salt	7996	8090	>10,000	Confinement
Leadville	Limestones	8090	8322	20,000 mg/l – 200,000 mg/l	Injection zone
Ouray	Limestone and dolomite	8322	8371	> 10,000 mg/l	Injection zone
Devonian (Elbert)	Shale, limestone, sandstone, and siltstone	8371	8681	> 10,000 mg/l	Injection zone
Cambrian	Siltstone, dolomite, and shale	8681	9180	182,246 mg/l	Injection zone
Precambrian	Crystalline	9180	Basement	>10,000	Confinement

The Well Completion reports which contain the formations' names and depths of formations starting from the surface to the Devonian (Elbert) were obtained from the Well Completion and Recompletion Report dated October 30, 1984. The data for the base of the Ouray and depths of the Devonian (Elbert) and Cambrian formations were obtained from additional information submitted by the applicant. EPA acknowledges that the depths listed in the Well Completion and Recompletion Report differ from those provided in comments submitted by the applicant due to variations in geological interpretations. It has been our policy to first consider values submitted in Well Completion or Recompletion Reports and Logs which are obtained from the State of Colorado's database first and then to consider additional data certified by a Professional Geologist. The total dissolved solids values and zone types have been obtained from the permit application, additional data submitted by the permitted, and the reference document Ground Water Atlas of the United States, Segment 2. The applicant will be required to collect and report water quality data collected from the proposed injection zones. Water quality data will be collected to confirm the total dissolved solids content in the Undifferentiated Devonian and Cambrian Formations. A Fracture Finder Log will be run prior to receiving an authorization to inject to identify potential pathways and to comply with the regulatory requirement under 40 CFR 146.12(d)2.

Proposed Injection Zone(s) (TABLE 2.2)

An injection zone is a geological formation, group of formations, or part of a formation that receives fluids through a well. The proposed injection zones are listed in TABLE 2.2.

Injection will occur into an injection zone that is separated from USDWs by a confining zone which is free of known open faults or fractures within the Area of Review.

TABLE 2.2
INJECTION ZONES
DWD-1

Formation Name	Top (ft)	Base (ft)	TDS (mg/l)	Fracture Gradient (psi/ft)	Porosity	Exempted?*
Leadville - Ouray	8,090	8,371	20,000-200,000	0.54		
Devonian (Elbert)	8,371	8,681	>10,000			
Cambrian	8,681	9,180	182,246			

*** C - Currently Exempted**
E - Previously Exempted
P - Proposed

The applicant is requested to obtain and provide additional data. Pore pressure or Reservoir pressure data should be submitted prior to the receipt of an authorization to begin injection (see 40 CFR 146.12(b)(2). A pressure Fall Off Test shall be performed one (1) year after the receipt of a final authorization to begin injection and annual thereafter, in accordance with 40 CFR 146.13(d)(1). Water quality analysis for the proposed formations shall be collected in accordance with 40 CFR

146.12 and 40 CFR 146.14.a.8 of the chemical, physical, and radiological characteristics. Compatibility testing of the injectate and the formation minerals shall be performed in accordance with 40 CFR 146.14(b)(6) prior to receiving authorization to begin injection.

Confining Zone(s) (TABLE 2.3)
A confining zone is a geological formation, part of a formation, or a group of formations that limits fluid movement above the injection zone. The confining zone or zones are listed in TABLE 2.3

TABLE 2.3
CONFINING ZONES

FORMATION NAME	GEOLOGICAL DESCRIPTION	TOP DEPTH, ft	BOTTOM DEPTH, ft	TDS mg/l	ZONE TYPE
Carmel	Siltstone, shale, limestone	995	1050	< 10,000	Confinement
Cutler	Sandstones and conglomerates	2426	4311	6,420	Confinement
Desert Creek	Carbonate rocks	6027	6076	> 10,000	Confinement
Top Salt	**Impermeable salt**	**6076**	**7996**	**> 10,000**	**Confinement**
Base Salt	**Impermeable salt**	**7996**	**8090**	**> 10,000**	**Confinement**
Precambrian	**Crystalline**	**9180**	**Basement**	**> 10,000**	**Confinement**

Based upon information submitted by the applicant, a portion of the Cutler Formation serves as confinement and the remaining portion serves as a USDW. *The bolded zones are the upper (Paradox Salts) and lower (Precambrian) confining zones for the proposed injection interval.*

Underground Sources of Drinking Water (USDWs) (TABLE 2.4)
Aquifers or the portions thereof which contain less than 10,000 mg/l total dissolved solids (TDS) and are being or could in the future be used as a source of drinking water are considered to be USDWs. The USDWs in the area of this facility are identified in TABLE 2.4.

TABLE 2.4
UNDERGROUND SOURCES OF DRINKING WATER (USDW)

FORMATION NAME	GEOLOGICAL DESCRIPTION	TOP DEPTH, ft	BOTTOM DEPTH, ft	TDS	ZONE TYPE
Quaternary	Alluvial sands and gravels, loess, colluvium windblown sands	0	995	< 10,000 mg/l	USDW
Navajo	Sandstone	1050	1437	< 10,000 mg/l	USDW
Wingate	Sandstone	1437	1537	< 10,000 mg/l	USDW
Chinle	Siltstone, sandstone,	1537	2323	< 10,000	USDW

	shale, and limestone			mg/l	
Chinarump		2323	2426	< 10,000 mg/l	USDW
Cutler	Sandstones and conglomerates	2426	4311	6,420 mg/l	USDW

PART III. Well Construction (40 CFR 146.22)

TABLE 3.1
WELL CONSTRUCTION REQUIREMENTS
DWD-1

Casing Type	Hole Size (in)	Casing Size (in)	Cased Interval (ft)	Cemented Interval (ft)
Conductor	36	30	0 - 59	0 - 59
Surface	14 ¾	10 ¾	0 – 3,807	0 – 3,807
Longstring	9 ⅞	7 ⅝	0 – 8,479	550 – 8,479

The approved well completion plan will be incorporated into the Permit as APPENDIX A and will be binding on the Permittee. Modification of the approved plan is allowed under 40 CFR 144.52(a)(1) provided written approval is obtained from the Director prior to actual modification.

The well construction information presented above has been obtained from October 30, 1984 Well Completion or Recompletion Report and Log which has been obtained from the Colorado Oil and Gas Commissions database. The information presented above and incorporated into Appendix A of the application has been obtained from both the October 30, 1984 Well Completion or Recompletion Report and supplemental data submitted by the applicant. The applicant shall submit a revised Well Completion or Recompletion Report and Diagram to EPA prior to receiving authorization to begin injection into the DWD-1 well. A Completion/Recompletion Report has been used to determine the top of cement in the 7 ⅝ casing at 550 ft based upon information submitted by the applicant.

Casing and Cementing (TABLE 3.1)
The well construction plan was evaluated and determined to be in conformance with standard practices and guidelines that ensure well injection does not result in the movement of fluids into USDWs. Well construction details for this "new" injection well is shown in TABLE 3.1.

Remedial cementing may be required if the casing cement is shown to be inadequate by cement bond log or demonstration of Part II (External) mechanical integrity.

Once the well has been constructed, the applicant shall run a cement bond log on the DWD-1 well to demonstrate the presence of adequate cement behind pipe A CBL will be used to determine the quality of cement behind pipe.

CURRENT WELL SCHEMATIC

Well Name Doe Canyon 1 (DWD-1) **Original Well Name** DCU 19-40-17 #1
Pilot API # 05-033-06078
S/T API # : N/A
Section 19 **Township** 40N **Range** 17W
Surface Hole: 240' FNL, 240' FEL Section 19, T40N R17W NMPM Elevation 7264'

Spud Date: 11/1/1983
Pilot Completion Date: 5/16/1984
Re-entry Start Date: 8/13/2012
Re-entry Completion Date: 2/14/2013

Updated: 6/13/2013 WDS

Conductor Casing TOC behind 4 1/2"@340' per CBL 1/21/2013
Size 30 in
Set at 59 ft Conductor @ 59 ft

Surface Casing 7-5/8" Csg Patch @ 806 ft
Size 10-3/4 in
Set at 3807 ft TOC 7-5/8" @2,830 per CBL 8/17,2013
Wt. 45.5 ppf Grade K-55 surface to 3807 ft
Hole Size 14-3/4 in
Est. T.O.C. surface ft
10-3/4" Csg Shoe @ 3807 ft

Production Casing
Size 7-5/8 in
Wt. 26.4 ppf Grade K-55 from surface to 4168 ft
Wt. 26.4 ppf Grade L-80 from 4168 to 5487 ft
Wt. 29.7 ppf Grade L-80 from 5487 to 5968 ft
Wt. 39 ppf Grade SS-95 from 5968 to 8051 ft
Wt. 33 ppf Grade 13 CR from 8051 to 8479 ft
Hole Size 9-1/2 in
Est. T.O.C. 2800 ft

Production Liner
Size 4-1/2 in
Wt. 11.6 ppf Grade J-55 from surface to 8243 ft

ProductionTubing

Run Date: 2/12/13	Top	Bottom
KB	0	9
250 JTS 2-3/8" 4.6# EUE 8RD CLS TBG	9	8171
ON/OFF TOOL	8171	8172
NP ASIX Packer	8172	8178
1 PUP 2-2/8" 4.6# EUE 8RD CLS TBG	8178	8189

Leadville Top @ 8091'
Set Date: 2/8/13
Pkr Set @ 8172 ft

Acid Date: 1/18/84, 4/4/84
Acidize perfs w/ 20,000gal 15% HCl

4-1/2" Csg Shoe @ 8243 ft

Acid Date: 4/18/84
Acid stimulate perfs w/ 40,000gal 15% HCl
and 40,000gal salt sat gel in 4 stages

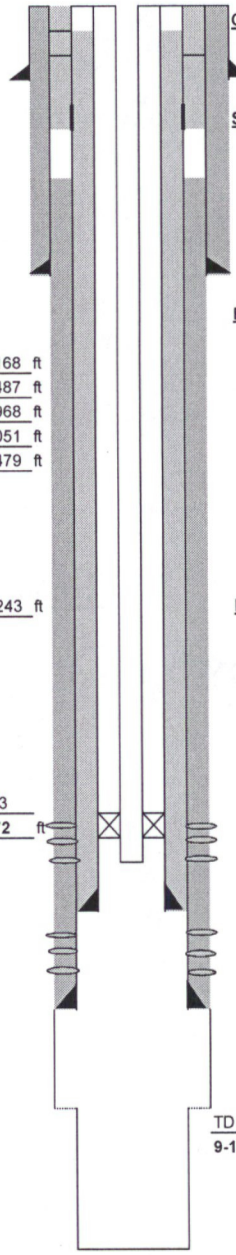
TD Date: 1/10/84
PBTD @ 8326 ft

7-5/8" Csg Shoe @ 8479 ft

Acid Date: 9/29/12
Acidize sqzd perfs w/ 5,000 gal 15% HCl

Acid Dates: 10/2/12, 10/3/12
Acidize sqzs & open perfs w/ 2,000 gal 18% HCl
& 9,000 gal 28% HCl

TD Date: 9/13/12
6-1/2" OH to 9500'



Conductor Cement
cement with ready-mix to suface

Surface Cement
Date Cemented: 11/13/1983
Lead : 2680 sx Lite, 2% CaCl2, 1/4#/sk flocele
Tail : 300 sx Class B, 32% CaCl2, 1/4#/sk flocele,
1% Halad-9
Note : circ 40 bbls dehydrated cmt

Prod Cement
Date Cemented: 12/6/1983
Lead: 1215 sx Lite, 1/4#/sk flocele, 12.8% Salt
Tail: 150 sx Class H, 0.6% HR4
disp w/ 388 bbl H2O w/ Tretolite K700 & K490
Note : no cmt to pits, ran temp survey TOC = 550'
CBL run 8/17/12 TOC = 2800'

Date Patch Cemented: 9/22/2012
Lead: 435 sx 50/50/POZ, 2% CaCl2, .1% CFR-3
Note : circ to surface, rev circ 17.7 bbls

Liner Cement
Date Cemented: 1/12/2013
Lead: 670 sx Lite, .2% HR-5
Tail: 150 sx 50/50/POZ, .1% CFR-3, .2% Halad-9
Note : No cmt to surface

Sqz Date: 3/13/84
Cmt sqz perf from 8100' to 8286' w/ 200 sx

Perf Dates: 3/14/84, 3/19/84, 4/16/84
7924 - 7925, 8065 - 8064
8100' - 8134', 8143' - 8146', 8158' - 8162'
8176' - 8188', 8212' - 8218', 8278' - 8286'
4 shots/ft with 292 total shots (3 times)

Sqz Dates: 8/28/12 & 8/30/13
Cmt sqz perfs w/ 200 sx + 300 sx Class G

Perf Date: 9/30/12 & 10/3/12
8398' - 8474' & 8278' - 8333'
Re perf above interval 2/5/13

TD Date: 12/3/83
9-1/2" OH to 8482'

Table 5

Doe Canyon Well No. 2 Formation Fluid Analysis Summary

Test Name	Result	Units
Bicarbonate	1,330	mg/l
Calcium	5,450	mg/l
Chloride	9,900	mg/l
Iron	48.9	mg/l
Hardness as CaCO3	17,400	mg/l
Potassium	465	mg/l
Magnesium	1,500	mg/l
Sodium	5,560	mg/l
pH	5.94	-
Specific Gravity	1.128*	-
Total Dissolved Solids	39,300	mg/l

Source: CDS Laboratories (1991). *This value likely in error. See text.